IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1(Original). A method for decoding transmitted data symbols over a communication channel exhibiting intersymbol interference comprising the steps of:

receiving said data symbols, said symbols resulting from encoding performed on a sequence of information bits via a cascade of finite state machine representations of an error control code in combination with said communication channel; and

applying a search-based decoding algorithm to the received data symbols, wherein said search-based decoding algorithm:

emulates each finite state machine representation and computes estimates of received symbols as it moves along the branches of a tree representative of said finite state machine representations,

computes metrics between the estimates of received symbols and the data symbols actually received, and

searches paths of the tree in an order and direction determined by the computed metrics.

2(Original). A method in accordance with claim 1, wherein a finite state machine representation of said communication channel comprises a finite impulse response characterization.

3(Original). A method in accordance with claim 1, wherein a finite state machine representation of said encoded data symbols comprises a trellis.

4(Original). Apparatus for decoding transmitted data symbols over a communication channel exhibiting intersymbol interference comprising:

a receiver for receiving said data symbols, said symbols resulting from encoding performed on a sequence of information bits via a cascade of finite state machine representations of an error control code in combination with said communication channel; and

a processor for applying a search-based decoding algorithm to the received data symbols, wherein said search-based decoding algorithm:

emulates each finite state machine representation and computes estimates of received symbols as it moves along the branches of a tree representative of said finite state machine representations,

computes metrics between the estimates of received symbols and the data symbols actually received, and

searches paths of the tree in an order and direction determined by the computed metrics.

5(Original).   Apparatus in accordance with claim 4, wherein a finite state machine representation of said communication channel comprises a finite impulse response characterization.

6(Original).   Apparatus in accordance with claim 4, wherein a finite state machine representation of said encoded data symbols comprises a trellis.

7(Original).   Apparatus for joint equalization and decoding of data symbols transmitted over a communication channel, comprising:

a channel estimator;

a symbol estimator;

a branch metric calculator;

a sequential decoding algorithm; and

an information retrieval module;

said channel estimator using a finite state machine representation of said communication channel to estimate the modulation effect of said channel on received symbols;

said symbol estimator emulating a finite state machine to compute estimates of received data symbols as the algorithm moves along branches of a trellis;

TI-33032   - 3 -

said branch metric calculator computing metrics between the estimates of received symbols and a received sequence of data symbols;

said sequential decoding algorithm being responsive to said metrics for determining which of a forward and backward direction to proceed in and which branch of said trellis to choose; and

said information retrieval module retrieving the sequence of information bits from the symbol estimates associated with a path traced by the sequential decoding algorithm.

8(Original).   Apparatus in accordance with claim 7, wherein said sequential decoding algorithm comprises a Fano State Machine.

9(Original).   Apparatus in accordance with claim 7, wherein said information retrieval module comprises an uncoder.

10(Original).   A computer readable medium, having thereon computer program code for decoding transmitted data symbols, said program code applying a search-based decoding algorithm to received data symbols, wherein:

said symbols result from encoding performed on a sequence of information bits via a cascade of finite state machine representations of an error control code in combination with a communication channel; and

said search-based decoding algorithm:

emulates each finite state machine representation and computes estimates of received symbols as it moves along the branches of a tree representative of said finite state machine representations,

computes metrics between the estimates of received symbols and the data symbols actually received, and

searches code tree paths in an order determined by the computed metrics.

11(Original).   A medium in accordance with claim 10, wherein a finite state machine representation of said communication channel comprises a finite impulse response characterization.

12(Original). A medium in accordance with claim 10, wherein a finite state machine representation of said encoded data symbols comprises a trellis.